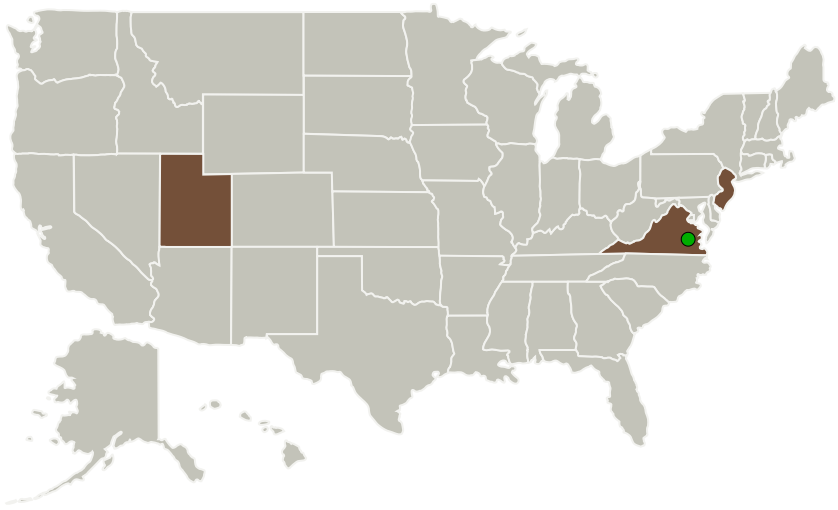
ShortWave Infrared Focal plane Technology for Close-range Active Mineralogy Mapping (SWIFT-CAMM), Phase I

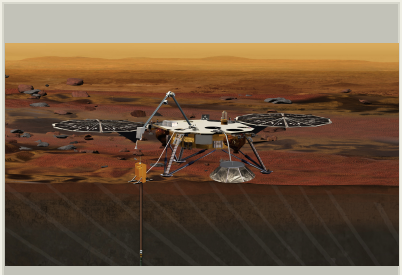
Completed Technology Project (2015 - 2016)

Project Introduction

We propose to develop a Photon-Counting Integrated Circuit (PCIC) mega-pixel focal plane array (FPA) imager with highest sensitivity, lowest noise and hence highest signal-to-noise ratio (S/N) among all imagers covering the shortwave infrared band, and to incorporate the prototype PCIC imager into a prototype imaging spectroscopy CAMM instrument for real-time operation on a planetary surface to guide rover targeting, sample selection (for missions involving sample return), and science optimization of data returned to earth, thus improving science return from instruments used to study the elemental, chemical, and mineralogical composition of planetary materials. During Phase I, we will develop and prototype a limited-size array of PCIC detector pixels as well as design and model the imaging spectrometer CAMM instrument. In Phase II, we will develop and prototype a mega-pixel PCIC focal plane array (FPA) imager as well as the imaging spectrometer CAMM instrument incorporating the PCIC imager.

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Wavefront LLC	Lead Organization	Industry Minority-Owned Business	
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia
Utah State University(USU)	Supporting Organization	Academia Alaska Native and Native Hawaiian Serving Institutions (ANNH)	Logan, Utah

Primary U.S. Work Locations	
New Jersey	Utah
Virginia	

Project Transitions

June 2015: Project Start

June 2016: Closed out

Closeout Summary: ShortWave Infrared Focal plane Technology for Close-range Active Mineralogy Mapping (SWIFT-CAMM), Phase I Project Image

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/139327)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Wavefront LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Jie Yao

Co-Investigator:

Jie Yao

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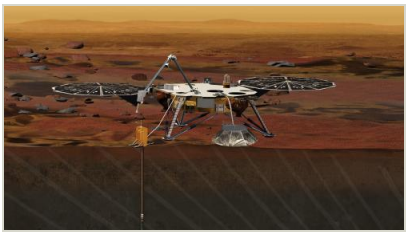
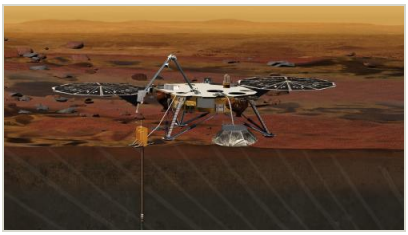
Images



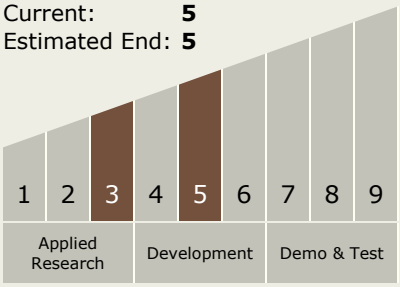
Briefing Chart Image
ShortWave Infrared Focal plane Technology for Close-range Active Mineralogy Mapping (SWIFT-CAMM), Phase I
(https://techport.nasa.gov/image/131172)



Final Summary Chart Image
ShortWave Infrared Focal plane Technology for Close-range Active Mineralogy Mapping (SWIFT-CAMM), Phase I Project Image
(https://techport.nasa.gov/image/131542)

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



Technology Areas

Primary:

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System